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| 09/940,651 | 08/29/2001 | Chia Chi Feng | 2769-106 | 4794 |

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| ART UNIT | PAPER NUMBER |
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| 2655 | |

DATE MAILED: 05/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/940,651 | FENG, CHIA CHI | |
| | Examiner | Art Unit | |
| | James S. Wozniak | 2655 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on 3/3/2005.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1, 3, 5-6, 8, 10, 12-14, and 16-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,3,5-6,8,10,12-14 and 16-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 08/29/2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. In response to the office action from 12/8/2004, the applicant has submitted an amendment, filed 3/3/2005, amending Claims 1, 3, 5-6, 8-9, 13-14, 17-18, and 19-20, while canceling Claims 2, 4, 7, 9, 11, and 15 and arguing to traverse the art rejection based on the limitation regarding the detection of a vowel utilizing the comparison of characteristic parameters against a rule for vowel recognition *(Amendment, Page 11)*. The applicant's arguments have been fully considered but are moot with respect to the new grounds of rejection in view of Marley *(U.S. Patent: 4,181,813)* and Wright et al *(U.S. Patent: 3,553,372)*.

2. With respect to **Claim 9**, the examiner has withdrawn the previous objections directed towards minor informalities, since the objection is now moot due to the cancellation of the claim.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1, 3, 5-6, 17, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al *("A Mandarin Speech Dictation System Based on Neural Network and Language Processing Model," 1994)*, in view of Marley *(U.S. Patent: 4,181,813)*, and further in view of Wright et al *(U.S. Patent: 3,553,372)*.

With respect to **Claim 1**, Huang discloses:

Processing a phonetic sound generated by a user and transforming the phonetic sound into a phonetic waveform *(reception of an input speech signal, Fig. 1, and Page 442, Experimental Conditions)*;

Dividing a sound packet of the phonetic waveform into different parts of consonant, wind, and vowel *(segmentation, Page 439, Preprocessing Process; and vowel, consonant, and tone recognizer, Fig. 1)*;

Recognizing the different parts of the sound packet respectively *(vowel recognizer and consonant recognizer, Fig. 1)*;

Combining the recognized parts for determining a character corresponding to the phonetic sound *(homonym characters, Fig. 1)*; and

Completing the phonetic recognition *(output text resulting from recognition, Fig. 1)*.

Huang does not specifically disclose that a vowel is recognized by comparing characteristic parameters including turning number and slope against a rule for vowel recognition, however Marley teaches a system and method for recognizing a vowel according to characterization rules utilizing slope and waveform transitions *(Col. 10, Line 31- Col. 11, Line 13, and Fig. 8, Element 33A)*.

Huang and Marley are analogous art because they are from a similar field of endeavor in phonetic classification of speech. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Huang with the rules for vowel characterization utilizing slope and waveform transitions as taught by Marley to provide an efficient means of recognizing vowels in addition to consonants and sharp transient sounds using recognition algorithms *(Marley, Col. 2, Lines 44-50; and Col. 10, Lines 3-7)*.

Huang in view of Marley does not specifically suggest that a vowel is recognized by comparing characteristic parameters including a wave number (zero-crossings), however the use of zero-crossings in vowel recognition is well known in the speech recognition art as is evidenced by Wright. Wright teaches a system capable of classifying consonants, vowels, and unvoiced sounds based on certain waveform characteristics *(Col. 5, Lines 10-20; Figs. 8 and 9)*, wherein vowels are recognized based on a zero-crossing number compared to a threshold *(Col. 5, Lines 36-70)*.

Huang, Marley, and Wright are analogous art because they are from a similar field of endeavor in phonetic classification of speech. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Huang in view of Marley with the means for classifying a vowel based on zero crossing measurements as taught by Wright in order to provide a well known means of further analyzing speech for vowel classification using zero crossing measurements *(Wright, Col. 1, Lines 68-73)*.

With respect to **Claim 3**, Marley further recites:

The part of consonant has a waveform or gradation, affricate, extrusion, or plosive and the part of wind is much higher in frequency than the parts of consonant and vowel *(fricative consonants and high frequency hiss, Col. 14, Line 57- Col. 15, Line 23)*.

With respect to **Claim 5**, Huang discloses:

Processing a phonetic sound generated by a user and transforming the phonetic sound into a phonetic waveform *(reception of an input speech signal, Fig. 1, and Page 442, Experimental Conditions)*;

Analyzing physical properties of the phonetic waveform for acquiring characteristic parameters of the waveform *(cepstral vectors, Page 439, Preprocessing Process)*;

Dividing a sound packet of the phonetic waveform into parts of consonant, wind and vowel, according to the characteristic parameters *(vowel, consonant, and tone recognizer, Fig. 1, and segmentation, Page 439, Preprocessing Process)*;

Analyzing the parts of consonant and vowel for waveform characteristics thereof, so as to recognize a character consonant corresponding to the part of consonant and a character vowel corresponding to the part of vowel *(finding homonym characters, Fig. 1)*;

Combining the recognized character consonant and character vowel for obtaining a corresponding character *(homonym characters, Fig. 1)*, and

Completing the phonetic recognition *(output text resulting from recognition, Fig. 1)*.

Huang does not specifically disclose that a vowel is recognized by comparing characteristic parameters including turning number and slope against a rule for vowel recognition, however Marley teaches a system and method for recognizing a vowel according to

characterization rules utilizing slope and waveform transitions *(Col. 10, Line 31- Col. 11, Line 13, and Fig. 8, Element 33A)*.

Huang and Marley are analogous art because they are from a similar field of endeavor in phonetic classification of speech. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Huang with the rules for vowel characterization utilizing slope and waveform transitions as taught by Marley to provide an efficient means of recognizing vowels in addition to consonants and sharp transient sounds using recognition algorithms *(Marley, Col. 2, Lines 44-50; and Col. 10, Lines 3-7)*.

Huang in view of Marley does not specifically suggest that a vowel is recognized by comparing characteristic parameters including a wave number (zero-crossings), however the use of zero-crossings in vowel recognition is well known in the speech recognition art as is evidenced by Wright. Wright teaches a system capable of classifying consonants, vowels, and unvoiced sounds based on certain waveform characteristics *(Col. 5, Lines 10-20; Figs. 8 and 9)*, wherein vowels are recognized based on a zero-crossing number compared to a threshold *(Col. 5, Lines 36-70)*.

Huang, Marley, and Wright are analogous art because they are from a similar field of endeavor in phonetic classification of speech. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Huang in view of Marley with the means for classifying a vowel based on zero crossing measurements as taught by Wright in order to provide a well known means of further analyzing speech for vowel classification using zero crossing measurements *(Wright, Col. 1, Lines 68-73)*.

**Claim 6** contains subject matter similar to Claim 3, and thus, is rejected for the same reasons.

With respect to **Claim 17**, Huang in view of Marley, and further in view of Wright teaches the phonetic recognition method as applied to Claim 5. Also Huang further discloses multiple recognition databases *(Page 442)*.

**Claim 19** contains subject matter similar to Claims 2 and 17, and thus, is rejected for the same reasons.

5. **Claims 8, 10, 12-14, 16, 18, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of Marley, in further view of Wright, and in yet further view of Chen et al *(U.S. Patent: 5,751,905)*.

With respect to **Claim 8**, Huang in view of Marley, and further in view of Wright teaches the system and method for vowel, consonant, and wind speech classification utilizing zero crossing rate, transitions, and slope, as applied to Claim 1. Huang in view of Marley, and further in view of Wright does not specifically suggest determining a tone by utilizing fore and rear frequencies, however, Chen discloses:

Determining a fore frequency and a rear frequency of the sound packet *(determining rising and falling tones by utilizing pitch extraction, Col. 6, Lines 38-50)*.

Recognizing a tone for the phonetic sound according to a rule for determining the fore and rear frequencies *(rising and falling tones, Col. 6, Lines 38-50)*.

Huang, Marley, Wright, and Chen are analogous art because they are from a similar field of endeavor in phonetic recognition. Thus, it would have been obvious to a person of ordinary

skill in the art, at the time of invention, to combine the use of rising and falling tones in phonetic recognition as taught by Chen with the phonetic recognition method taught by Huang to provide a further means of recognizing corresponding characters in phonetic recognition by detecting tone changes between a rising and falling tone along with the pitch contour taught by Huang *(Page 439, Preprocessing Process)*. Therefore, it would have been obvious to combine Chen with Huang in view of Marley, and further in view of Wright for the benefit of obtaining further tone recognition means.

**Claims 10 and 14** contain subject matter similar to Claims 3 and 6, and thus, are rejected for the same reasons.

With respect to **Claim 12**, Chen further recites:

The fore frequency is determined by taking an average frequency for a first quarter region of the sound packet, and the rear frequency is determined by taking an average frequency for a final quarter region of the sound packet *(average pitch of rising and falling tones, Col. 7, Lines 18-58)*.

Although Huang in view of Marley, in further view of Wright, and in yet further view of Chen does not specifically teach that the fore and rear frequencies are determined by taking the average frequency for corresponding quarter regions of a sound packet, it would have been obvious matter of design choice to do so, since the applicant has not disclosed that acquiring average frequency data for specific quarter regions solves any stated problem or is for any particular purpose. The benefit for using such a quarter region for average frequency data acquisition would be to provide a sufficient averaging period to obtain tone data of an audio signal. Thus, in order to provide a sufficient averaging period, it would have been obvious to

one of ordinary skill in the art, at the time of invention, to utilize a corresponding quarter region for the acquisition of average frequency data in determining tone information of an audio signal.

**Claim 13** contains subject matter similar to Claims 5 and 8, and thus, is rejected for the same reasons.

**Claim 16** contains subject matter similar to Claim 12, and thus, is rejected for the same reasons.

**Claim 18** contains subject matter similar to Claims 13 and 17, and thus, is rejected for the same reasons.

With respect to **Claim 20**, Huang in view of Marley, in further view of Wright, and in yet further view of Chen teaches the phonetic recognition processing steps as applied to Claim 13 and phonetic recognition databases as applied to Claim 17.

## *Conclusion*

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Kellett *(U.S. Patent: 4,343,969)*- teaches vowel format classification using zero crossing rate and slope.

Hitchcock *(U.S. Patent: 4,388,495)*- teaches the detection of a vowel using zero crossing data.

Niyada et al *(U.S. Patent: 4,736,429)*- teaches a means for discriminating between unvoiced speech, vowels, and consonants.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (703) 305-8669 and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached at (703) 305-4827. The fax/phone number for the Technology Center 2600 where this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center receptionist whose telephone number is (703) 306-0377.

James S. Wozniak
3/16/2005

DAVID L. OMETZ
PRIMARY EXAMINER